

# TOWARDS A SUSTAINABLE AND RESILIENT CARP VALUE CHAIN IN NEPAL

*POLICY BRIEF*



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# EXECUTIVE SUMMARY

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This policy brief on developing a sustainable and resilient carp value chain in Nepal was compiled with the aim of providing an overview of fish seed supply and flow of product from the hatchery level to consumer markets. Although carp aquaculture is growing continuously in Nepal and is profitable, the sector faces challenges in terms of inconsistent supply of fish seed, fish mortality, water shortages and natural hazards like flooding, which disrupt the value chain at all levels for lengthy periods of time. Furthermore, while the sector is mainly characterized by a work-force that is middle-aged and male, there is a growing influx of young women into the field. Women in Nepalese aquaculture remain vulnerable to discrimination and with low status. The policy brief proposes four actions:

- 1) Adopt an adaptive strategy and action plan for disaster-risk reduction and to build resilience
- 2) Develop capacity for sustainable and climate-smart aquaculture
- 3) Develop and adopt regulatory policies to ensure economic stability of the sector and public safety
- 4) Create and contribute to gender justice in the carp value chain

# BACKGROUND

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Aquaculture has shown great progress in Nepal since its introduction in the 1940s. While capture fisheries dominated fish production in the 1950s, the average annual production from aquaculture has grown rapidly and continuously, becoming one of the fastest growing sectors in Nepal (annual growth 9%). Aquaculture production contributed to 4.2% of the Agriculture Gross Domestic Product (GDP) and 1.3% in Nepal's national GDP in 2015-2016, valued at 2.2 billion € (DoFD, 2017), a major increase compared to 2003-2004 where contribution was slightly over 2% of Agriculture GDP and the total value of production was about 60 million € (Pradhan, 2005). Aquaculture production was estimated at 55 500 tonnes in 2015-2016 (DoFD, 2017). The majority (90%) of aquaculture production is from carp polyculture (Pradhan, 2005), which is practiced mainly in the southern plain Terai of Nepal, which holds 94% of all pond areas in Nepal and covers 98% of fish production in the country (Pradhan, 2005). DoFD (2014), estimated that approximately 136000 households were engaged in aquaculture, fisheries and associated activities, with about 504 000 individuals actively involved in the sector. It has further been established that in 2003/2004 aquaculture activities employed about 58 000 persons (Pradhan, 2005), whereas in 2005-2016 the number is estimated to have grown to 122 722 (DoFD, 2017).

However, development of the carp aquaculture sector has been hindered by an unstable carp supply chain, with farmers being unable to source fingerlings of all species, timely, and at affordable costs either from government or from private hatcheries, which inherently make proper planning of fish farming activities difficult. Furthermore, produce is mostly sold on-farm and in local nearby villages, leaving the sector to develop in small silos, that are unconnected and vulnerable to various disruptions.

This policy brief examines the carp value chain in Nepal, focusing on two aspects: (1) the seed-supply chain from the hatcheries to the fish farmer and (2) the carp value chain from fish farmer to the market, capturing the flow of product and the barriers to flow of product along the value chain

# APPROACH

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This policy brief is based on a study conducted in 2017-2018 by carrying out 1) a literature review to compile existing information on fish marketing status and constraints in Nepal, 2) a workshop with various stakeholder representatives to carry out a stakeholder mapping exercise, 3) a survey of carp hatcheries and nurseries to describe their operations, geographical coverage, broodstock availability and the challenges they face in production of fish seed, 4) a survey of the key stakeholders in the consumer supply chain and of fish shops to determine the type of products on the market and 5) a workshop with various stakeholder representatives to provide feedback on the results of the surveys. The study covered two districts: Chitwan and Nawalparasi. Eight hatcheries, 16 nurseries, 296 fish farms and 27 fish shops were surveyed. In addition, the survey covered 8 markets in Chitwan and Nawalparasi Districts and interviews with 9 stakeholder representatives.

# RESULTS

**Two supply fish seed chains and six consumer chains identified**

- The carp value chain in Nepal comprises two supply fish-seed supply chains. Fish seed moves from hatcheries to nurseries and to ongrowing farms or fish seed moves directly from hatcheries to ongrowing farms. The value chain is short and straightforward and keeps fish seed relatively affordable.

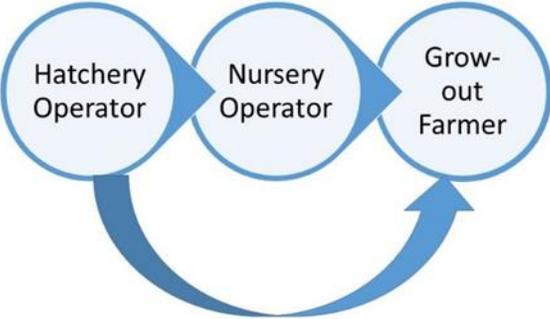


Figure 1. Fish seed supply-chains in Chitwan and Nawalparasi Districts, Nepal

- The carp value chain in Nepal comprises six chains were identified moving fish from ongrowing farms to consumers. Middlemen along the chain collect fish and help to move it from one point to another. While the value-chain becomes longer, the presence of middlemen help deals with challenges related to logistics along the value chain.

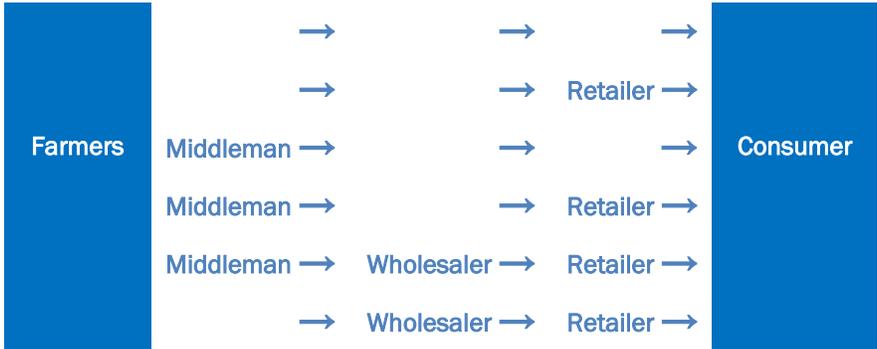


Figure 2. Fish supply chains from farmer to consumer in Chitwan and Nawalparasi Districts, Nepal

### **Disaster-risk mitigation is essential**

- Hatcheries, nurseries and ongrowing fish farms are very vulnerable to natural hazards such as floods, which occur with certain frequency and turn into disasters. Recovery from disasters is not instant and their effects become major disruptions along the value chain, for a long time. Resilience building is important for the fish farming sector located in a region prone to natural hazards.
- Hatcheries, nurseries and ongrowing fish farms are all dependent on water sources that may face disruptions at one time or another, especially during dry seasons. This can affect fish farming operations adversely.

### **Technical capacity building is required for sustainable and climate-smart aquaculture**

- Hatcheries, nurseries and ongrowing fish farms do not mention fish disease management measures, although fish mortality is a problem. Pest and predators are a challenge especially for farmers and nursery owners. Hatcheries and nurseries need improved technical capacity to sustain the timely and sustainable production of good quality fish seed.
- Development of good quality, low cost feeds for fish is essential.
- Ongrowing fish farms and fish shops need improved technical capacity to manage the cold chain, development of new fish products, improve fish shelf life and to market their fish products. Furthermore, improved processing techniques will help reduce post-harvest losses and create diversity in fish products available on the market.
- Awareness-raising of the benefits of consuming fish and development of the sector is also essential and can be done through social media, radio and school awareness programmes.

### **Development of regulatory policies can ensure economic stability and public safety**

- Regulation of pricing mechanisms for fish on the market can create needed stability in the sector.
- Implementing hygiene and food safety regulations at bazaars and fish shops helps curb food-borne diseases and the public health status.

### **Gender main-streaming in the carp value chain provides opportunities for growth**

- The carp value chain in Nepal is characterized as being a mostly middle aged, male dominated field, in line with global trends. Some women have entered the field and the fact that they are young women, is encouraging for the sector. However, women are more disadvantaged than men, facing discrimination and low status, which can hinder the social and economic development of their communities. Involving women in fish farming operations in Nepal has generally expanded to include the entire family unit and has improved household incomes, as well as their food and nutrition status. Support to women fish farmers is essential in terms of subsidies on equipment and infrastructure development.

# RECOMMENDATIONS

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## **Adopt an adaptive strategy and action plan for disaster-risk reduction and to build resilience**

We recommend building an adaptive approach and action plan for disaster-risk reduction mechanisms for hatcheries, nurseries and fish farmers. The development of early warning systems and flood risk mitigation using simple technological tools suitable for the region are important.

## **Develop capacity for sustainable and climate-smart aquaculture**

We recommend improving technical capacity of hatchery and nursery operators as well as fish farmers on water quality management and fish health for instance through short, practical on-farm trainings. Furthermore, we recommend improving technical capacity of fish farmers and fish shop owners on developing their fish product portfolio through value-added products suitable for the region, taking into account local food culture and norms. Improved technical capacity on selling and marketing their fish products is also important. In addition, we recommend producing short, practical, simple field guides on different aspects of fish farming, fish product development and fish marketing, in Nepali, to cater for the fish farming sector where the majority have only up to secondary school level education or lower. We also recommend implementing awareness-raising events and campaigns to communicate to the public about the health benefits of consuming fish.

## **Develop regulatory policies to ensure economic stability of the sector and public safety**

We recommend that regulatory policies are adopted for pricing of fish products to ensure stability in the sector. In addition, we recommend implementing hygiene and food safety measures, especially at bazaars and fish shops to help curb food-borne diseases and ensure public safety and wellbeing.

## **Create and contribute to gender equity in the carp value chain**

We recommend creating and contributing to gender equity in the carp value chain by mainstreaming and integrating gender analyses and perspectives into aquaculture policy and implementation of activities at local, regional and national levels. This also includes creating a system for subsidies and micro-financing available to young women fish farmers.

# REFERENCES

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DoFD (Directorate of Fisheries Development). 2014. Annual report 2012-2013. Central Fisheries Building, Balaju, Kathmandu, Nepal.

DoFD Directorate of Fisheries Development). 2017. Annual report 2015-2016. Central Fisheries Building, Balaju, Kathmandu, Nepal.

Pradhan. G. 2005. National Aquaculture Sector Overview, Nepal. National Aquaculture Sector Overview Fact Sheets. Food and Agriculture Organisation of the United Nations. Rome. [online] available:

[http://www.fao.org/fishery/countrysector/naso\\_nepal/en](http://www.fao.org/fishery/countrysector/naso_nepal/en)

## FURTHER INFORMATION

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